भारतीय मानक

Indian Standard

IS 17286 : 2019

वस्त्रादि — पड़ाव की परिवर्तनीयता के साथ बहु प्रयोजन जलरोधक वर्षा पोंचो — विशिष्टि

Textiles — Water Proof Multipurpose Rain Poncho with Convertibility as Bivouac — Specification

ICS 13.340.99

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December 2019 **Price Group 7**

Textiles Protective Clothing Sectional Committee, TXD 32

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Textiles Protective Clothing Sectional Committee had been approved by the Textile Division Council.

Water proof multipurpose rain poncho with convertibility as bivouac is made from a water repellent material to keep the body dry from the rain. It also works as a temporary camp without tents or cover, used especially by soldiers or mountaineers. Polyamide (nylon 6 or nylon 66) is being used to manufacture this rain poncho. The main reason for selecting polyamide is that, because, it has outstanding tensile strength and scrub resistance, high elasticity but also a higher specific heat capacity compared to other materials. Beside it is the requirement of paramilitary forces.

This standard covers the general clothing design, the minimum performance levels of the material used and the methods of test for determining these performance levels.

The composition of the Committee responsible for the formulation of this standard is given in Annex D.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

TEXTILES — WATER PROOF MULTIPURPOSE RAIN PONCHO WITH CONVERTIBILITY AS BIVOUAC — SPECIFICATION

1 SCOPE

1.1 This standard prescribes the requirement of water proof multipurpose rain poncho with convertibility as bivouac and a pouch to pack the poncho herein referred as 'poncho' and 'pouch' respectively.

1.2 This standard does not specify general appearance, feel, etc, of the 'poncho' and 'pouch'.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

3 MATERIAL AND MANUFACTURE

3.1 The design and shape of the poncho and pouch shall be as per Fig.1 to Fig. 4.

3.2 Poncho

3.2.1 The woven fabric shall be manufactured using continuous multifilament yarns of polyamide on warp and weft direction. The denier of continuous multifilament yarns shall be 80 ± 5 percent. The woven fabric shall have 1 up 1 down plain weave. The width of the fabric shall generally be 180 cm to avoid any stitching in between the poncho. However, the lower width of the fabric may also be used for manufacture of poncho as per the agreement between buyer and the seller. In such case, seam sealing shall be done and the seam strength shall not be less than 80 percent of the fabric strength when tested as per the method specified in IS/ISO 13935-1. The selvedges of the fabric shall be firm and straight. The fabric shall be 'Heat set' and fully shrunk.

3.2.2 The polyamide fabric shall be finished with water repellent finish.

3.2.3 The back side of the polyamide fabric shall be uniformly coated with polyurethane (PU). The coating shall be smooth and it shall firmly adhere to the fabric. The coated fabric shall be pliable and free from tackiness, stains, pinholes, surface irregularities, wrinkles, patches and all other coating defects. The coating shall not have any objectionable odour.

3.2.4 The water repellent finish and polyurethane coating shall not mask the colours used in dyeing and printing of fabric used in the manufacture of poncho and pouch.

3.2.5 The polyamide fabric used for the manufacture of poncho shall be coated with polyurethane coating on one side and the other side shall be finished with water repellent chemical. The poncho shall be manufactured using two such types of fabric layers. The PU coated sides of both the layers of fabric shall face each other in such a way that water repellent face of both layers shall face outward. All the four sides of the 'Poncho' shall be finished with the fold of 30 ± 10 mm as shown in the Fig. 1A and Fig. 1B.

3.2.6 The dimensions of poncho with hood shall be as given in Fig. 1A and Fig. 1B and Fig. 2A and Fig. 2B.

3.2.7 *Hood*

The dimensions and location of hood shall be as given in the Fig. 1A and 1B and Fig. 2A and 2B. The hood shall be made of double layers of PU coated polyamide fabric. In the face periphery of the hood, a 25 mm fold shall be provided and through this fold, an arrangement of passing a cord (with cord length adjuster and cord lock) which can reduce or increase the opening of the face of the hood shall be provided. The cord length adjuster and cord lock shall be made out of nylon. The placement of cord length adjuster and cord lock shall be as shown in Fig. 2A. For reducing or increasing the face opening of hood, it shall be provided with a slide fastener as shown in Figs. 2A and 2B. The inner layer of the hood shall also be provided with two triangular ear vent made out of net mesh for ventilation purpose. The place and dimension of the net fabric shall be as shown in Fig. 2B. The ear vent shall be covered from outside with an inverted patch pocket made of double layer of same material having opening at the bottom.

3.2.8 *Pockets*

The 'Poncho' shall be provided with six pockets as shown in Fig. 1A. The dimensions of the pockets shall be as shown in the Fig. 1A. The closing and opening of the pocket shall be done with the help of 25 ± 1 mm wide hook and loop fastener. The ‘Poncho’ shall also be provided a pocket at the back of the inner side of the poncho. The dimensions of the pockets shall be as shown in the Fig. 1B.

3.2.9 *Cord*

Each pocket of the poncho shall be provided with a braided cord made out of polyamide filament yarn. The cord shall be attached to the inner side of the pocket.

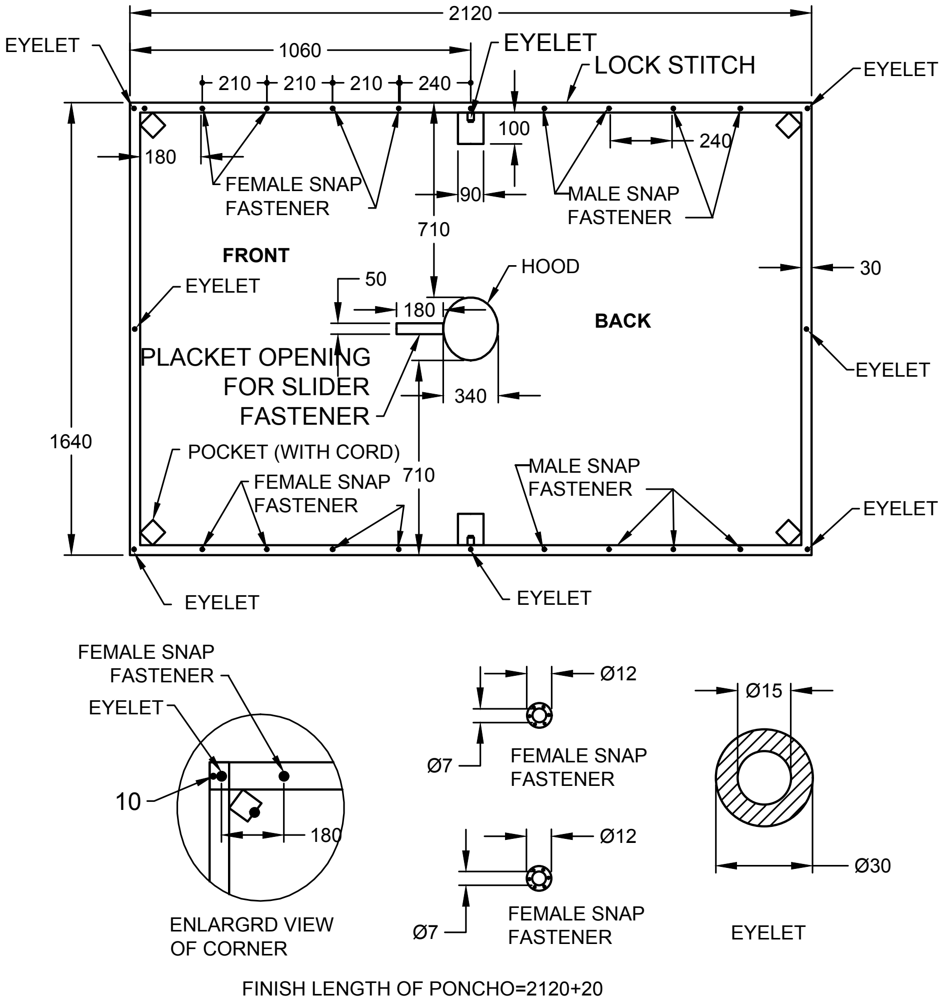
NOTE — For guidance, the core of the cord may be made of two 840 denier multifilament polyamide yarns and sheath may be braided with 16 number of 1 700 denier polyamide multifilament yarn.

3.2.10 *Eyelet and Snap Fastener*

‘Poncho’ shall be provided with six brass sail type eyelets of size 30 L with washer bronzed confirming to IS 4084, fixed in each corner and centre on the fold. The placement of these eyelets shall be as shown in the Fig. 1A and 1B. There shall be 8 sets of snap fasteners (eight male snap fasteners and eight female snap fasteners). The dimensions of the eyelets and snap fastener (male and female) shall be as shown in the Fig.1A and 1B. The snap fastener shall be cage type, size 3/3 and shall confirm to the requirements specified in IS 4741.

3.3 Pouch

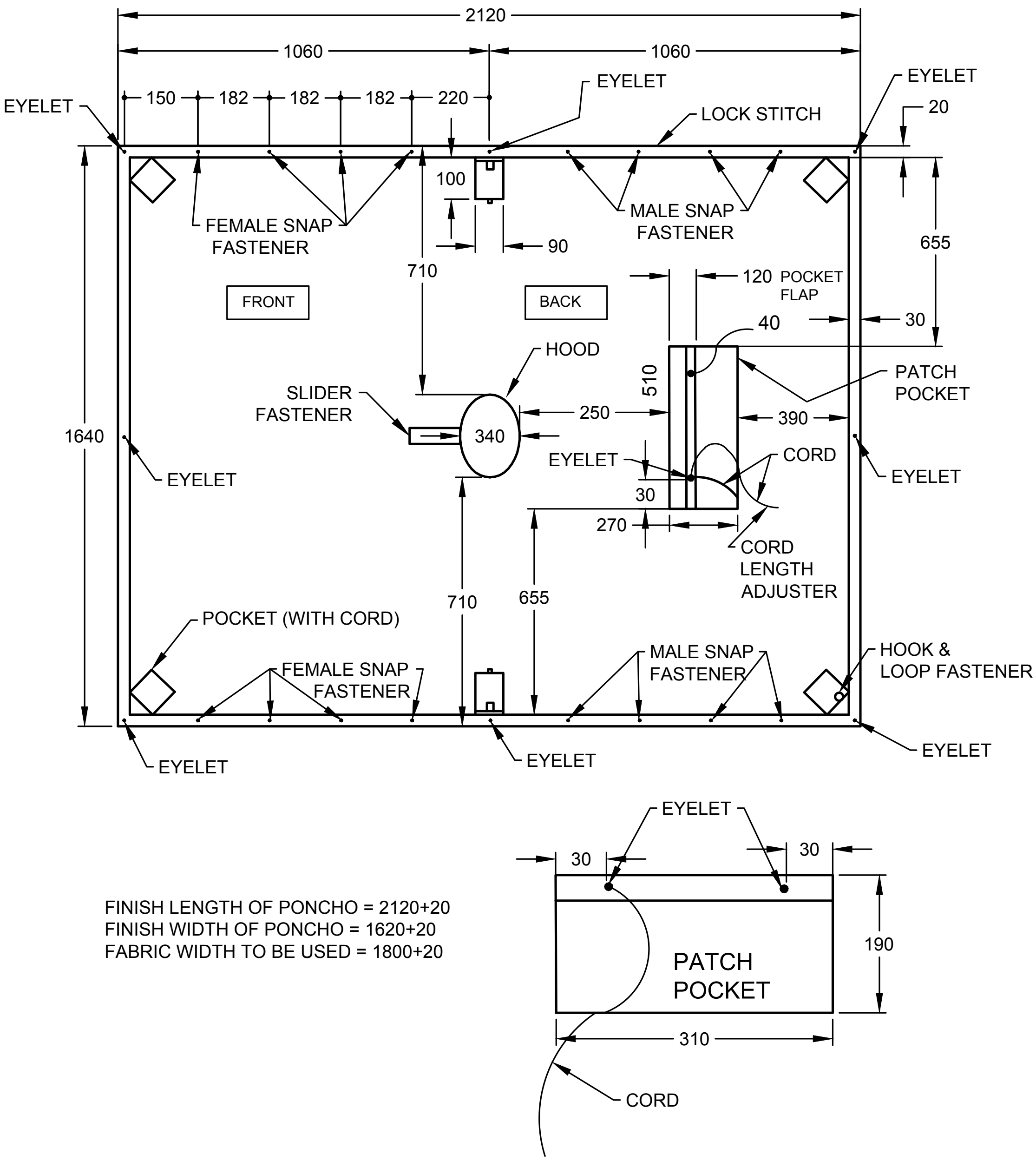
The pouch (*see* Fig. 3) shall be made out of single layer finished PU coated polyamide fabric as specified for the ‘Poncho’. The dimension of pouch shall be 300 ± 10 mm × 250 ± 10 mm so the folded poncho can be packed in this pouch. To close and open the pouch, an open end polyester slide fastener of ‘medium special’ designation confirming to IS 14181 (Part 1) shall be attached to the front side of the pouch. The length of the slide fastener shall be 210 ± 10 mm. The back side of pouch shall be provided with two loops (*see* Fig. 3) made out of 25 ± 1 mm wide polyamide tape, whose weave particulars are shown in Fig. 4. A handle (pouch



FINISH LENGTH OF PONCHO=2120+20
FINISH WIDTH OF PONCHO=1620+20
FABRIC WIDTH TO BE USED=2120+20

All Dimensions are in millimetres.

FIG. 1A PONCHO (OUTER VIEW)

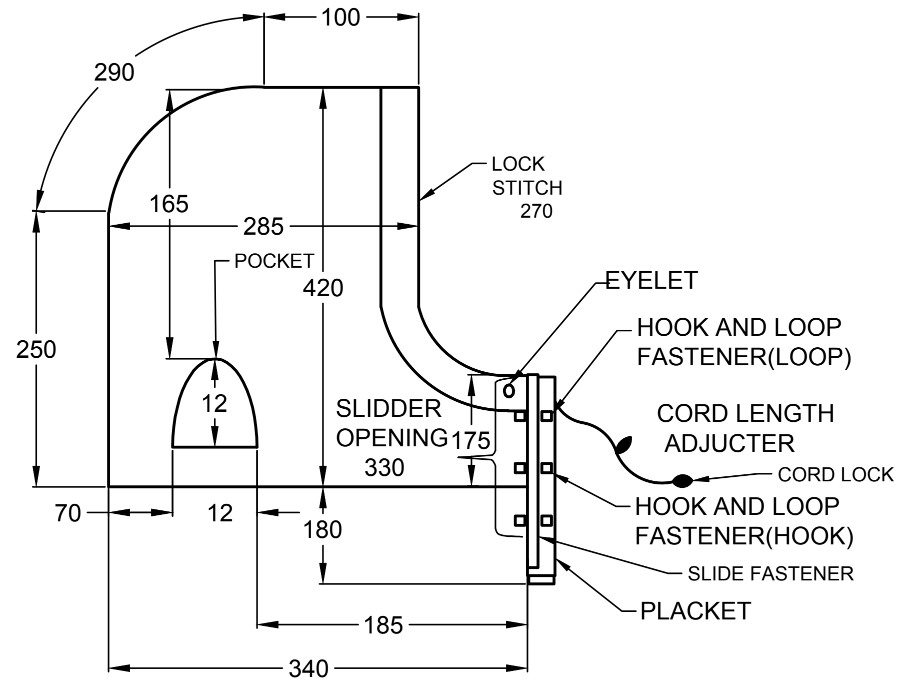


FINISH LENGTH OF PONCHO = 2120+20
FINISH WIDTH OF PONCHO = 1620+20
FABRIC WIDTH TO BE USED = 1800+20

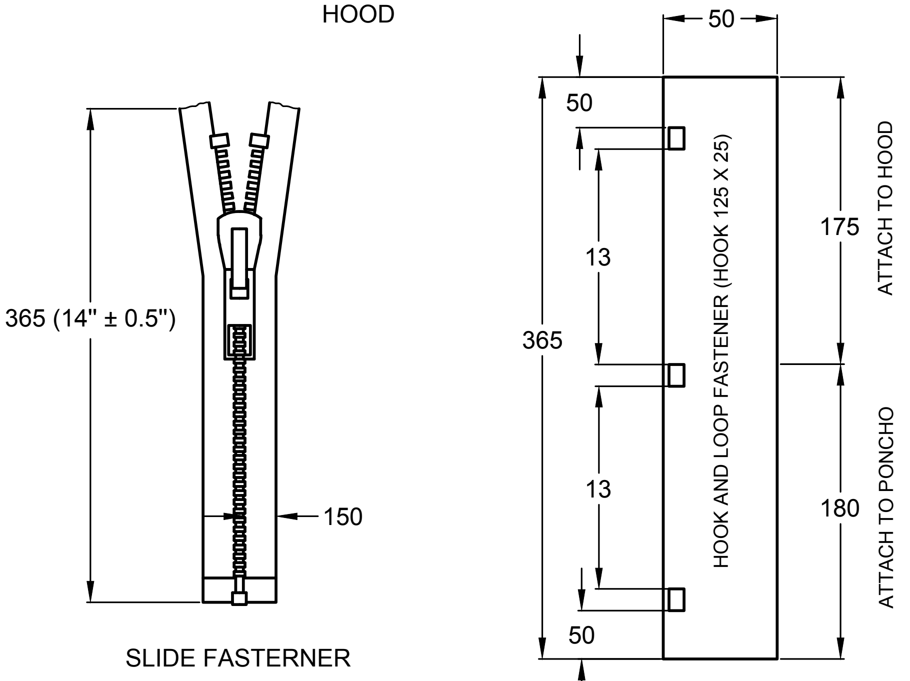
All dimensions in millimetres

FIG. 1B PONCHO (INNER VIEW)

FIG. 1 PONCHO



HOOD



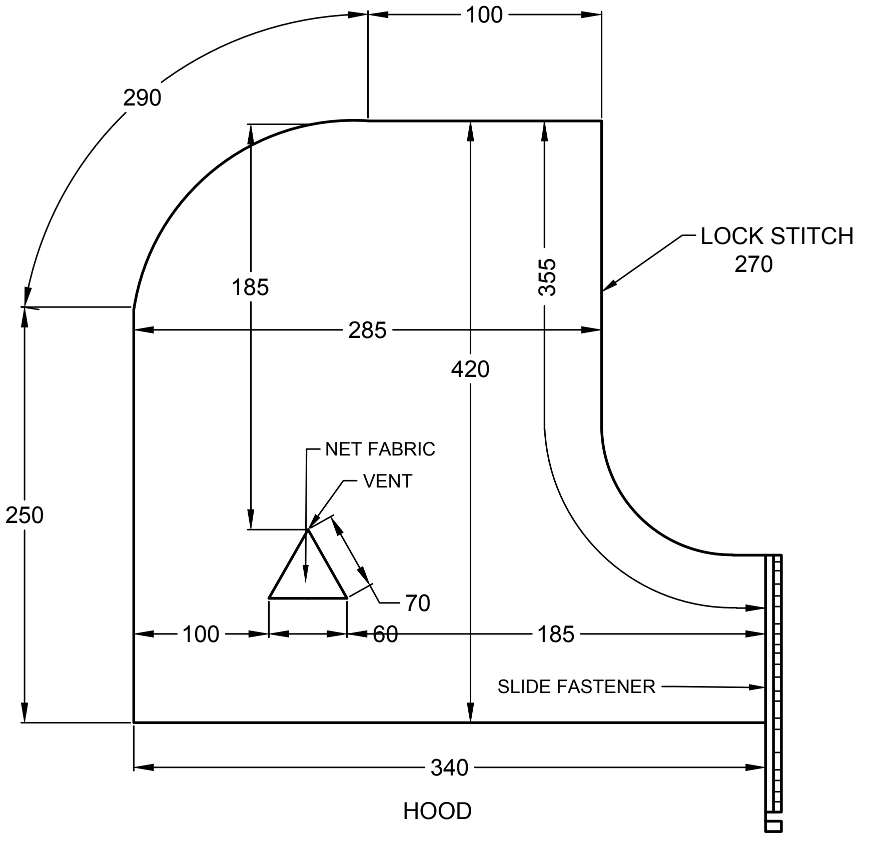
SLIDE FASTERNER

BOTTOM EDGE

PLACKET TO COVER THE SLIDER FASTENER
AND FOR HOOK AND LOOP FASTENER

(All dimensions are in millimeters)

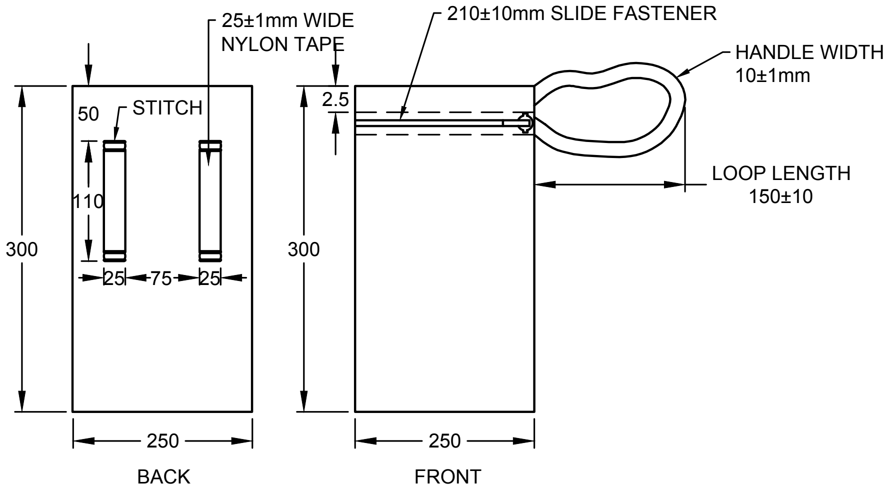
FIG. 2A DIMENSION OF HOOD ‘PONCHO’ (OUTER VIEW)



2 B DIMENSION OF HOOD 'PONCHO'(INNER VIEW)

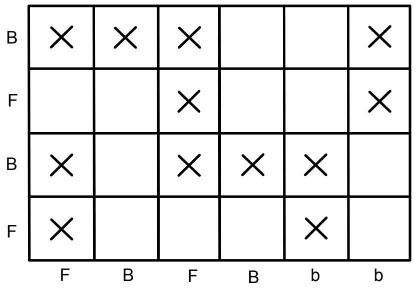
All dimensions are in millimeters

FIG. 2 DIMENSIONS OF HOOD 'PONCHO'



All dimensions are in mm.

FIG. 3 POUCH OF 'PONCHO'



	F	B	F	B	b	b
B	×	×	×			×
F			×			×
B	×		×	×	×	
F	×				×	

NYLON TAPE 25±1mm WIDE WEAVE REPEAT
(F - FACE, B - BACK, b - BINDING)

NOTE : ONE PICK IN THE WEAVE REPEAT REPRESENTS TWO PICKS IN THE FABRIC.
ONE END IN THE WEAVE REPEAT REPRESENTS TWO ENDS IN THE FABRIC.
THE FABRIC TO BE WOVEN ON NEEDLE LOOM.

PARTICULAR OF 25 ± 1 mm WIDE NYLON TAPE:
1. NYLON MULTI-FILAMENT YARN SHALL BE USED
2. FOR GUIDANCE:
   i WARP COUNT : 850 DENIER
   ii BINDING YARN (WARP) : 850 DENIER
   iii WEFT COUNT : 450 DENIER
3. TOTAL ENDS (FULL WIDTH) : 203(175 WARP ENDS + 28 BINDING WARP END)
   PICKS PER DM : 340

ALL DIMENSIONS IN MILLIMETRES

FIG. 4 NYLON TAPE 25 ± 1 mm WIDE - WEAVE REPEAT

hanging loop) shall also be provided with the pouch as shown in Fig.4. It shall be a single folded PU coated polyamide fabric having 10 ± 1 mm width and loop length of 150 ± 10 mm as shown in Fig. 4.

4 STITCHING

Lock stitch shall be employed to assemble components of poncho. In the case of lock stitch, minimum four stitches per cm shall be employed wherever stitching has to be carried out. The stitching shall be done with even tension and all loose ends shall be securely fastened off. Polyamide sewing thread confirming to variety No. L2 of IS 4229 shall be used.

4.1 Tolerances

Wherever tolerations have not been specified, the following tolerances shall be considered in the case of fabric:

Sl No.	*Dimension* *(mm)*	*Tolerance* *(mm)*
(1)	(2)	(3)
i)	Up to 10	± 0.5
ii)	Above 10 and up to 30	± 1.0
iii)	Above 30 and up to 50	± 2.0
iv)	Above 50 and up to 80	± 4.0
v)	Above 80 and up to 100	± 6.0
vi)	Above 100 and up to 500	± 10.0
vii)	Above 500 and up to 2 000	± 20.0

5 FREEDOM FROM DEFECT

The poncho shall be visually examined. It shall be evenly stitched, free from missed stitches, holes, cuts, puckering and other defects. The colour of the sewing thread used for stitching shall not bleed or stains. The poncho shall be free from dyeing and printing defects. The fabric used for manufacture of poncho shall be free from any crinkling or rustling sound and shall be pliable and free from tackiness and any objectionable odour. The poncho shall be free from any other defect which may significantly affect the appearance or serviceability.

6 REQUIREMENTS

6.1 The polyamide fabric used in the poncho and pouch shall conform to the requirements given in Table 1.

6.2 The cord used in the poncho shall meet the requirement as given in the Table 2.

6.3 The 25 ± 1 mm wide polyamide tape used in the loops of pouch shall comply with the requirement given in the Table 3.

6.4 Slide fastener shall comply with the acceptance criteria specified in IS 14181.

6.5 The hook and loop fastener (25 ± 1 mm wide) shall meet the requirements as given in IS 8156.

Table 1 Requirements of PU Coated Fabric for 'Poncho' and 'Pouch'

(*Clause* 6.1)

Sl No. (1)	Characteristic (2)	Requirement (3)	Method of Test, Ref to (4)
i)	Nature of fibre/filament	Polyamide (Nylon 6 or Nylon 66)	IS 667
ii)	Nature of coating	Polyurethane	Annex B
iii)	Width, cm	As declared + 1 percent with no negative tolerance	IS 1954
iv)	End/dm, *Min*	360	IS 1963
v)	Picks/dm, *Min*	270	IS 1963
vi)	Mass (Single layer), g/m^2	85 ± 5 percent	IS 1964
vii)	Mass of de-proofed fabric, g/m^2	70 ± 8 percent	After de-proofing determine mass as per IS 1964 (For de-proofing, *see* Annex C)
viii)	Breaking strength (strip test) (5 × 20 cm fabric between grips), N, *Min*:		IS 7016 (Part 2)
	a) Warp-wise	800	
	b) Weft-wise	650	
ix)	Tearing strength (Method A-1), N, *Min*:		IS 7016 (Part 3)
	a) Warp-wise	90	
	b) Weft-wise	90	
x)	Colour fastness to washing, Test C(3):		IS/ISO 105-C10
	a) Change in colour	4 or better	
	b) Staining on adjacent fabric	4 or better	
xi)	Colour fastness to rubbing		IS 766
	a) Dry	4 or better	
	b) Wet	4 or better	
xii)	Colour fastness to light	4 or better	IS/ISO 105-B02
xiii)	Dimensional change due to relaxation, *Max*, percent:		IS 2977
	a) Warp-wise	2.0	
	b) Weft-wise	2.0	
xiv)	Resistance to accelerated ageing at 70°C ± 1°C for 168 h in hot air circulating oven	No cracks shall be observed	IS 7016 (Part 8)
xv)	Resistance to low temperature [(-)30 ± 2°C] for 6 h	No cracks shall be observed	IS 7016 (Part 10)
xvi)	Resistance to damage by flexing (after 100,000 cycle)	No cracks shall be observed	IS 7016 (Part 4)
xvii)	Blocking	No peeling of coating on separation	IS 7016 (Part 9)
xviii)	*p*H value of aqueous extract (Cold method)	6.0 to 8.0	IS 1390
xix)	Water repellency (face side- uncoated), spray rating, *Min*	100	IS 390
xx)	Hydrostatic pressure head test (Water column height at 60 cm for 60 min), (face side- uncoated)	No percolation of water through the fabric or wetting of the outer surface	IS 7016 (Part 7)
xxi)	Bundesmann-shower test (Double layers as used in the poncho- face side- uncoated), (Expose the specimen to the shower for 30 min):		IS 392
	a) Amount of water absorption, *Max*, percent	40	
	b) Amount of water penetration, ml	Nil	
	c) Wetting of inner surface	No	

Table 1 *(Concluded)*

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
xxii)	Moisture vapour transmission, mg/cm^2/h, *Min*	2.0	Annex F of IS 16390
xxiii)	Bending length, cm, *Max*:		IS 6490
	a) Warp-wise	2.2	
	b) Weft-wise	2.2	
xxiv)	Separation of polyurethane (PU) film	On fraying threads in warp and weft directions up to 5 mm after cutting the fabric from any portion, there shall not be a continuous PU film on the areas from where the threads have been removed.	

NOTE — All the tests shall be carried out on single layer except Bundesmann-Shower test.

Table 2 Requirements of Cord

(*Clause* 6.2)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Nature of fibre/filament	Polyamide (Nylon-6 or Nylon 66)	IS 667
ii)	Length, cm	250 ± 5 percent	IS 1954
iii)	Mass per linear metre, g	3.5 ± 5 percent	Guideline of IS 1964
iv)	Breaking strength (200 mm gauge length), N, *Min*	900	IS 1969 (Part 1)
v)	Colour fastness to washing, Test C(3):		IS/ISO 105-C10
	a) Change in colour	4 or better	
	b) Staining on adjacent fabric	4 or better	
vi)	Colour fastness to light	4 or better	IS/ISO 105-B02
vii)	Dimensional change due to relaxation, length wise directions, percent, *Max*	2.0	As per guideline of IS 2977
viii)	*p*H value of aqueous extract (cold method)	6.0 to 8.0	IS 1390

Table 3 Requirements of 25 ± 1 mm Wide Polyamide Tape

(*Clause* 6.3)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Nature of fibre/filament	Polyamide (Nylon-6 or Nylon 66)	IS 667
ii)	Number of ends in full width, *Min*	78	IS 1963
iii)	Number of picks/dm, *Min*	340	IS 1963
iv)	Width, cm	2.5 ± 5 percent	IS 1954
v)	Mass per linear metre, g	25 ± 5 percent	IS 1964
vi)	Colour fastness to washing, Test C(3):		IS/ISO 105-C10
	a) Change in colour	4 or better	
	b) Staining on adjacent fabric	4 or better	
vii)	Colour fastness to light	4 or better	IS/ISO 105-B02

7 MARKING

7.1 The poncho shall be legibly and indelibly marked with the following information:

a) Manufacturer's name, initials or trade-mark;
b) Instructions for storage and care;
c) Date of manufacture; and
d) Any other information required by the law in force and/or by the buyers.

7.2 BIS Certification Marking

The poncho conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the poncho may be marked with the Standard Mark.

8 PACKAGING AND PACKING

8.1 The poncho shall be delivered in a clean and dry condition. Poncho shall be suitably folded and put in to pouch. Five such poncho shall be made into one unit pack (bundle), placing one over the other and then suitably tying them with three ply twine jute (*see* IS 1912).

8.2 Four such bundles shall form one bale. These bales shall be packed in such a way that it ensures full protection to the contents of the bale. Hessian cloth shall be used to cover the bale. This cloth shall securely sew around the bale. The bale shall be stitched with double three ply jute twine with not less than twelve stitches per dm, taking care not to pierce the inner wrapping during stitching. Sufficient hessian cloth shall be pulled out to form 'ears' of about fifteen cm in length. The bale shall be suitably secured by fastening with 12 mm polypropylene strap.

8.3 The poncho may also be packed as agreed to between the buyer and the seller.

8.4 Before dispatch each bale/package shall be legibly marked suitably with the following information:

a) Nomenclature and category number of the store;
b) Quantity packed in the bale/package;
c) Serial number of the bale/package;
d) Month and year of packing;
e) Name/trademark of the manufacture;
f) Gross weight of the bale/package, in kg;
g) Name and address of the consignee; and
h) Inspection note number and date.

9 SAMPLING AND CRITERIA FOR CONFORMITY

9.1 The sampling procedure detailed in **9.2** and **9.3** shall give desired protection to the buyer and the seller, provided that the lot submitted for inspection is homogeneous. To achieve this, the manufacturer shall maintain a system of process control at all stages of manufacturing ensuring that the poncho tendered by him for inspection shall comply with the requirements of this standard in all respects.

9.2 The manufacturer shall offer the stores serially numbered and arranged in such a way that the entire lot is accessible to the inspecting officer. The conforming of a lot to the requirement of this standard shall be determined on the basis of the tests carried out on the samples selected from it. The number of samples shall be selected at random in accordance with Table 4.

9.3 The number of test samples and the criterion for conformity for various characteristics shall be as given in Table 5.

Table 4 Sample Size

(*Clause* 9.2)

Sl No.	Lot Size	Non Destructive Testing		Destructive Testing	
		No. of Poncho's to be Selected	Permissible Number of Non-Conforming Poncho's	No. of Poncho's to be Selected	Permissible Number of Non-conforming Poncho's
(1)	(2)	(3)	(4)	(5)	(6)
i)	0 – 300	10	1	2	0
ii)	301 – 500	20	2	3	0
iii)	501 – 1 000	30	3	5	0
iv)	1 001 – 3 000	50	5	8	0
v)	3 001 and above	80	5	13	1

NOTE — One complete poncho means poncho with pouch.

9.4 Lot

For the purpose of conformance inspection and test sampling, a lot is defined as all the completed poncho of the same size and type, with same assemblies, produced in one facility, using the same production processes and materials, and being offered for delivery at one time to buyer against a dispatch note.

9.5 Sealed Sample

In order to illustrate or specify the indeterminable characteristics, such as, general appearance, luster, feel and print design of the poncho, a sample has been agreed upon and sealed, the supply shall be in conformity with the sample in such respects.

9.6 The custody of the sealed sample shall be a matter of prior agreement between the buyer and seller.

Table 5 Criterion for Conformity

(*Clause* 9.3)

Sl No. (1)	Characteristic (2)	Number of Test Samples (3)	Criteria for Conformity (4)
i)	Dimensions, Nos. of ends and picks, visual colour inspection and freedom from defects	All the poncho's selected according to the column 3 of Table 1	Non-conforming poncho's not to exceed the corresponding number given in column 4 of Table 1
ii)	All other properties	All the poncho's selected according to the column 5 of Table 1	Non-conforming poncho's not to exceed the corresponding number given in column 6 of Table 1

NOTE — Test methods may be taken as guidance wherever specimen size is not sufficient as per standard.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No	*Title*
105-B02 : 2014	Textiles — Tests for colour fastness: Part B02 Colour fastness to artificial light: Xenon arc fading lamp test
105-C10 : 2006	Textiles — Tests for colour fastness: Part C10 Colour fastness to washing with soap or soap and soda
390 : 1975	Method for determining the water repellency of fabrics by water spray test (*first revision*)
392 : 1989	Textiles — Determination of water absorption and penetration of fabrics using bundesmann type apparatus (*third revision*)
667 : 1981	Methods for identification of textile (*first revision)*
766 : 1988	Method for determination of colour fastness of textile materials to rubbing (*first revision)*
1390 : 1983	Methods for determination of pH value of aqueous extracts of textile materials (*first revision*)
1912 : 1984	Specification for country jute twine (*second revision*)
1954 : 1990	Determination of length and width of woven fabrics — Methods (*second revision*)
1963 : 1981	Methods for determination of threads per unit length in woven fabrics (*second revision*)
1964 : 2001	Textiles — Methods for determination of mass per unit length and mass per area of fabrics *(second revision*)
1969 (Part 1) : 2018	Textiles — Tensile properties of fabrics: Part 1 Determination of maximum force and elongation at maximum force using the strip method (*fourth revision*)
2977 : 1989	Fabrics (other than wool) — Method for determination of dimensional changes on soaking in water (*first revision*)
4084 : 1978	Specification for eyelets and washers (sail) (*first revision*)
4229 : 1992	Textiles — Nylon sewing threads for aerospace purposes — Specification (*second revision*)
4741 : 1968	Specification for snap fasteners (four pieces)
6490 : 1971	Method for determination of stiffness of fabrics — Cantilever test
7016	Methods of test for coated and treated fabrics
(Part 2) : 2015	Determination of tensile strength and elongation at break (*second revision*)
(Part 3) : 1981	Determination of tear strength (*first revision*)
(Part 4) : 2003	Rubber-or plastics-coated fabrics — Determination of resistance to damage by flexing (*second revision*)
(Part 7) : 2009	Rubber-or plastics-coated fabrics — Determination of resistance to penetration by water (*second revision*)
(Part 8) : 1975	Accelerated ageing
(Part 9) : 2003	Rubber-or plastics-coated fabrics — Determination of blocking resistance (*second revision*)
(Part 10) : 1997	Rubber- or plastics-coated fabrics — Low-temperature bend test (*first revision*)
8156 : 2014	Fasteners for consumer goods — Synthetic hook and loop tape — Specification (*third revision*)

IS No	*Title*
IS/ISO 13935-1 : 2014	Textiles — Seam tensile properties of fabrics and made-up textile articles: Part 1 Determination of maximum force to seam rupture using the strip method (*first revision*)
14181 (Part 1) : 2002	Synthetic (plastic) slide fasteners — Special purpose: Part 1 Specification, selection and ordering guideline of the product (*first revision*)
16390 : 2015	Agro textiles — Nylon knitted seamless gloves for tobacco harvesters — Specification

ANNEX B

[*Table* 1, *Sl No.* (ii)]

B-1 IDENTIFICATION OF POLYURETHANE COATING

Take approximately 0.1 to 0.5 g of the coated fabric. Treat it with 10 to 20 ml glacial acetic acid by warming for several minutes. To this add 0.1 g p-dimethyamino benzaldehyde. The solution is further warmed for 2 to 3 min. If the solution turns yellow, indicates presence of polyurethane.

ANNEX C

[*Table* 1, *Sl No.* (vii)]

C-1 DE-PROOFING OF PU COATED FABRIC

Treat PU coated fabric for appropriate time with suitable de-proofing solvent like tetrahydrofuran, dichloromethane, methylene chloride etc.

ANNEX D

(*Foreword*)

COMMITTEE COMPOSITION

Textiles Protective Clothing Sectional Committee, TXD 32

Organization	*Representative(s)*
Northern India Textile Research Association, Ghaziabad	Dr Arindam Basu (***Chairman***) Dr M. S. Parmar (*Alternate*)
E.I. DU Pont India Private Limited, Gurugram	Shri Manoj Jhaver Shrimati Vedika Kapoor (*Alternate*)
Aeronav Industrial Safety Appliances, Noida	Shri Sandeep Hora
Arvind Limited, Gandhinagar	Shri Satyapriya Dash Shri Rahul Dev Mal (*Alternate*)
Border Security Force, New Delhi	Shri Prem Vishwas
Central Industrial Security Force, New Delhi	Shri A. K. Chaturvedi Shri Ravindra Kumar Meel (*Alternate*)
Central Reserve Police Force, New Delhi	Shri Randhir Kumar Jha Shri Partha S. Sahu (*Alternate*)
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Confederation of Indian Industry, New Delhi	Shri Suvendu Mahapatra
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